

Disclaimer:

This English translation is produced by machine translation and may contain errors. The JPO, the INPIT, and those who drafted this document in the original language are not responsible for the result of the translation.

Notes:

1. Untranslatable words are replaced with asterisks (****).
2. Texts in the figures are not translated and shown as it is.

Translated: 20:57:05 JST 09/17/2007

Dictionary: Last updated 09/07/2007 / Priority:

FULL CONTENTS

[Claim(s)]

[Claim 1] The processing method of the organic waste characterized by blowing the ** ozone which is the processing method of the organic waste which ozonizes in the preceding paragraph of a living thing processing step, and is used and discharged by this ozonization in the preceding paragraph of biological ***** processing.

[Claim 2] The processing method of the organic waste characterized by blowing the ** ozone which is the processing method of the organic waste which ozonizes in the preceding paragraph of a living thing processing step, and is used and discharged by this ozonization in the latter part of biological ***** processing.

[Claim 3] The processing method of the organic waste characterized by making it react with the ** ozone which is the processing method of the organic waste which ozonizes in the preceding paragraph of a living thing processing step, and is used and discharged by this ozonization, and the biogas which occurs at said living thing processing step.

[Claim 4] The processing method of the organic waste characterized by blowing into said living thing processing step the biogas which is the processing method of the organic waste which ozonizes in the preceding paragraph of a living thing processing step, and occurs at said living thing processing step.

[Claim 5] The processing method of the organic waste characterized by making the ** ozone which is the processing method of the organic waste which ozonizes in the preceding paragraph of a living thing processing step, and is used and discharged by this ozonization, and the bad smell discharged by the processing method of said organic waste react.

[Claim 6] The ** ozone which is the processing method of the organic waste which ozonizes in the preceding paragraph of a living thing processing step, and is used and discharged by this ozonization is blown in the preceding paragraph of biological ***** processing, The ** ozone used and discharged by this ozonization is blown in the latter part of biological *****

processing, It is made to react with the ** ozone used and discharged by this ozonization, and the biogas which occurs at said living thing processing step, The biogas which occurs at said living thing processing step is blown into said living thing processing step, And the processing method of the organic waste characterized by carrying out at least two or more among making the ** ozone used and discharged by this ozonization, and the bad smell discharged by the processing method of said organic waste react.

[Claim 7] The processing method of the organic waste according to claim 1 to 6 characterized by supplying the ozone which made it newly generate or it branched and supplied a part of ozone supplied to the preceding paragraph of a living thing processing step instead of waste ozone.

[Claim 8] The processing method of the organic waste according to claim 1 to 7 characterized by said living thing processing step being anaerobic fermentation processing of methane fermentation, alcoholic fermentation, etc.

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the processing method of an organic waste. Furthermore, this invention relates to the processing method of an organic waste of having used ozone, in detail.

[0002]

[Description of the Prior Art] Conventionally, in the process which processes organic wastes, such as livestock feces and urine, impurity removal, pulverization, etc. are pretreated, and by blowing ozone into livestock feces and urine, methane fermentation is performed, after solubilizing the solid in livestock feces and urine. It is because the Reason which a solid solubilizes can be solubilized by destroying the cell membrane of the microbe lump in the solid in livestock feces and urine and can raise the decomposition rate of an organic matter by ozone here. Moreover, in this process, the biogas obtained by methane fermentation is used for power generation etc. after desulfurization. Moreover, as for dewatered sludge, composting is performed after drying, and, as for separation liquid, biological ***** processing is performed [digestive juices]. In addition, in addition to solubilization of the solid in the livestock feces and urine by ozone, improvement in solubilization can also be performed by giving heat.

[0003] the reaction which adds ozone here -- although most blown ozone dissolves into liquid and it is used effectively for solubilization of a difficulty resolvability substance etc. in a tower (solubilization tower), during the exhaust air to generate, unreacted ozone is certainly contained. Ozone is a powerful oxidizer and is industrially useful. Moreover, since it is a

powerful oxidizer, if ozone is discharged out of the system of an organic waste handling process as it is, it is harmful to a human body. for this reason, ** ozone decomposition -- in the tower, ozone is emitted, after being processed by activated carbon. Thus, there is a problem that use of useful ozone is not industrially made efficient.

[0004]

[Problem to be solved by the invention] This invention is a making-in view of above-mentioned problem thing, reuses ** ozone and aims at controlling the quantity of the ** ozone exhausted out of the system of an organic waste processing institution.

[0005]

[Means for solving problem] In order to attain the above-mentioned purpose, the processing method of the organic waste concerning this invention is the processing method of the organic waste which ozonizes in the preceding paragraph of a living thing processing step, and is characterized by blowing the ** ozone used and discharged by this ozonization in the preceding paragraph of biological ***** processing. Moreover, it is characterized by the processing method of the organic waste concerning this invention blowing the ** ozone used and discharged by ozonization in another form in the latter part of biological ***** processing. Furthermore, it is characterized by making the processing method of the organic waste concerning this invention react with the ** ozone used and discharged by ozonization in another form, and the biogas which occurs at said living thing processing step.

[0006] Moreover, it is characterized by for the processing method of the organic waste concerning this invention blowing into said living thing processing step the biogas which occurs at a living thing processing step, and making it agitate in another form. Moreover, the processing method of the organic waste concerning this invention is characterized by making the ** ozone used and discharged by ozonization, and the bad smell discharged by the processing method of said organic waste react in another form. Moreover, the processing method of the organic waste concerning this invention is set in another form. The ** ozone used and discharged by ozonization is blown in the preceding paragraph of biological ***** processing, The ** ozone used and discharged by this ozonization is blown in the latter part of biological ***** processing, It is made to react with the ** ozone used and discharged by this ozonization, and the biogas which occurs at said living thing processing step, It is characterized by carrying out at least two or more among making the ** ozone used and discharged by blowing into said living thing processing step the biogas which occurs at said living thing processing step, and this ozonization, and the bad smell discharged by the processing method of said organic nature exhaust air thing react.

[0007] Organic wastes are wastes, such as livestock feces and urine, raw sludge, human waste sludge, and a kitchen garbage. A living thing processing step disassembles an organic waste using living things, such as a methane bacterium which disassembles an organic waste.

In addition, the living thing processing step in this invention means anaerobic fermentation processing of methane fermentation, alcoholic fermentation, etc. It is blowing ozone into an organic waste as ozonizing, disassembling the solid in an organic waste, and solubilizing. In addition, in this invention, ozonization is performed in an ozone reaction machine. Biological ***** processing is a step which performs ***** using living things, such as a bacillus. Biogas is gas discharged from a living thing, when living thing processing of the organic waste is carried out. For example, when methane fermentation of the organic waste is carried out, the gas having contained methane and hydrogen sulfide gas is discharged. Let the gas at this time be biogas.

[0008]

[Mode for carrying out the invention] The form of suitable implementation of the processing method of the organic waste applied to this invention based on an accompanying drawing is explained hereafter. In addition, what is using the same reference number in each Drawings shall express the same processing step and equipment.

[0009] [Reduction of the degree of color of the treated water in the preceding paragraph of 1:biological ***** processing of ***** of operation] 1 of ***** of implementation of the processing method of the organic waste applied to this invention at drawing 1 is shown. As illustrated, by the processing method of the organic waste of 1 of ***** of this operation, the livestock feces and urine which are one of the organic wastes first carry out impurity removal from 1, and inner solids, such as livestock feces and urine, are performed for crush etc. (step shown as two in a figure). the livestock feces and urine with which the impurity was removed and crush etc. was carried out -- an ozone reaction -- it is sent to a tower 3.

[0010] this ozone reaction -- ozone is supplied to a tower 3 from the ozone generator 5. The ozone generator 5 usually consists of the head end processes (the dusting machine, the compressor, the cooling device, etc.) and ozone generating portion of materials air. Although it is in the generating method of ozone partly, the electric discharge which has arranged the solid insulant to one field of an electrode theoretically, applied the volts alternating current to inter-electrode, and was continued at the last moment is produced, and it is made to generate. Since the generated ozone is decomposed, in the inter-electrode time, generation of ozone and the reaction of decomposition live together and ozone concentration is determined in the place where both balanced. Usually, when using air as materials and using oxygen as materials 3 to 4%, 6 to 8% of maximum ozone concentration is obtained, but when performing economical operation, it is used by lower ozone concentration. There are a monotonous type and a multipipe type in the electric discharge part structure of an ozone generator.

[0011] an ozone reaction -- the cell membrane of the microbe lump in the solid of an organic waste is destroyed by the ozone supplied to the tower 3, and a microbe is killed. By this, it solubilizes and the organic matter decomposition rate in a living thing processing step

(methane fermentation tub 7) improves. in addition, the supplied ozone -- an ozone reaction -- in order to supply from the bottom of a tower 3 -- the bubble of ozone -- an ozone reaction -- it is effective in raising the organic matter decomposition reaction velocity for agitating and solubilizing the inside of a tower 3. an ozone reaction -- you may apply heat 4 to a tower 3. an ozone reaction -- the excessive ** ozone 6 from a tower 3 is sent to the ** ozone recovery line 15. moreover, an ozone reaction -- the solubilized organic waste which is obtained from a tower 3 is sent to the methane fermentation tub 7.

[0012] In the methane fermentation tub 7 which is a living thing processing step, it is set as the environment where the methane bacterium which generates methane from organic wastes, such as temperature and PH, can live. In the methane fermentation tub 7, methane fermentation of the organic waste supplied with the methane bacterium is carried out, and the biogas containing methane, hydrogen sulfide, etc. and the digestive juices after methane fermentation are obtained. The biogas containing methane, hydrogen sulfide, etc. is sent to the desulfurization facility 9. Moreover, digestive juices are sent to a dehydrator 12. In addition, when sent to the desulfurization facility 9, by gas churning equipment 8, biogas is again returned from the bottom of the methane fermentation tub 7, and is used for churning in the methane fermentation tub 7. Since the biogas which is gas is supplied from a bottom, and the liquid of the organic waste in the methane fermentation tub 7 is agitated with air bubbles, it can agitate.

[0013] Iron oxide is beforehand installed in the desulfurization facility 9, and it has the function desulfurized from the gas of hydrogen sulfide. The biogas containing the methane sent to the desulfurization facility 9, hydrogen sulfide, etc. is desulfurized with iron oxide. The desulfurized biogas is sent to a gas tank 10, and is stored temporarily. From a gas tank 10, when gas utilization, such as power generation, is required, it is supplied suitably.

[0014] The digestive juices supplied to the dehydrator 12 from the methane fermentation tub 7 are dried by a dehydrator 12. After being dried, the sludge which remains is composted (step shown by 13 in a figure), and a compost 14 is obtained.

[0015] Moreover, the drying separation liquid obtained by the dehydrator 12 is sent to ozone oxidization equipment 16. ** ozone 6 is supplied to this ozone oxidization equipment 16 from the ** ozone recovery line 15. As for this ozone, it is desirable to be supplied from the bottom of ozone oxidization equipment 16. It is because the churning effect within ozone oxidization equipment 16 is also expectable. Within this ozone oxidization equipment 16, the degree reduction of color of drying separation liquid is performed by ozone. Generally the drying separation liquid with the high degree of color means that there are many living thing difficulty resolvability substances. That is, by methane fermentation, such as a methane bacterium, decomposition makes the difficult living thing difficulty resolvability substance living thing readily decomposable by ozone within ozone oxidization equipment 16, and the degree

reduction of color in drying separation liquid is performed by decomposing further by biological ***** processing. Moreover, [when performing biological ***** processing, the sources of nutrient, such as C and H, need to be the forms which are easy to be used for a living thing, but] By making readily decomposable difficulty resolvability substances, such as the degree of color, by operation of ozone, since it can use as the source of nutrient in the case of ***** , the effect that the function of latter biological ***** processing improves is also expectable.

[0016] The drying processing liquid by which ozone oxidation treatment was carried out to urine sewage disposal (step shown by 17 in a figure) from ozone oxidization equipment 16 is sent. As for drying processing liquid, biological ***** processing is performed in urine sewage disposal (step shown by 17 in a figure). In this biological ***** processing, the oxygen which filled biological need for oxygen is supplied, and ***** is performed. In urine sewage disposal (step shown by 17 in a figure), the treated water 18 by which biological ***** was carried out is discharged to a nature.

[0017] as mentioned above, an ozone reaction -- from a tower 3, the ** ozone 6 discharged to the ** ozone recovery line 15 is sent to ozone oxidization equipment 16, and is used effective in the improvement in ***** functional of drying separation liquid, and the degree reduction of color.

[0018] [Reduction of the degree of color of the treated water in the preceding paragraph of 2:biological ***** processing of ***** of operation] 2 of ***** of other operations of the processing method of the organic waste applied to this invention at drawing 2 is shown. In addition, in drawing 2 , the order relations to processing with the ozone oxidization equipment 16 of 1 of ***** of operation and urine sewage disposal (biological ***** processing is performed) (step shown by 17 in a figure) which 2 of ***** of this operation mentioned above differ, and other steps and equipment are the same. In 2 of ***** of this operation, as shown in drawing 2 , after drying separation liquid is first sent to sewage disposal (step shown by 17 in a figure), it is sent to ozone oxidization equipment 16 after a dehydrator 12. ozone oxidization equipment 16 -- an ozone reaction -- ** ozone is sent from a tower 3. With ozone oxidization equipment 16, reduction of the degree of color of final effluent 18 and sterilization are performed.

[0019] [-- making the biogas and ** ozone of ***** of operation of which 3:generating is done react -- hydrogen sulfide concentration -- reduction] -- 3 of ***** of other operations of the processing method of the organic waste applied to this invention at drawing 3 is shown. In addition, in drawing 3 , 1 of ***** of the operation which 3 of ***** of this operation mentioned above differs the point that ozone oxidization equipment 16 does not exist, and in that the front desulfurization facility 19 is between the methane fermentation tub 7 and the desulfurization facility 9, and, as for other steps and equipment, is the same.

[0020] With the desulfurization facility 9, biogas is desulfurized 3 of ***** of this operation

using expensive iron oxide. Then, use of expensive iron oxide can be reduced by installing the front desulfurization facility 19 in the preceding paragraph of the desulfurization facility 9. because, an ozone reaction -- the discharged ** ozone 6 is sent to the front desulfurization facility 19 through the ** ozone recovery line 15 from a tower 3. This sent ozone reacts with the hydrogen sulfide gas in biogas into the front desulfurization facility 19, and oxidizes hydrogen sulfide. Therefore, by ozone, hydrogen sulfide in biogas oxidizes and serves as sulfuric acid. Furthermore, by sprinkling water, such as treated water, to the front desulfurization facility concerned, sulfuric acid is melted underwater and it removes from a biogas line. For this reason, with the gas of hydrogen sulfide, the corrosion in the gas utilization line which the problem had can be prevented now.

[0021] 4: of ***** of [operation -- reduction] of hydrogen sulfide -- 4 of ***** of other operations of the processing method of the organic waste applied to this invention at drawing 4 is shown. [1 / in addition, / of ***** of the operation which 4 of ***** of this operation mentioned above in drawing 4] The point that ozone oxidization equipment 16 does not exist, and a point with the biogas recovery line 21 connected between gas churning equipment 8 and a gas tank 10, The ** ozone recovery lines 15 differ in that it connects with the line 20 which connects gas churning equipment 8 and the desulfurization facility 9, and other steps and equipment have them. [same]

[0022] In 4 of ***** of this operation, the biogas stored in the gas tank 10 is sent to gas churning equipment 8 through the biogas recovery line 21. Biogas is supplied to the methane fermentation tub 7 from gas churning equipment 8. Then, the sulfur oxidization bacillus which exists in the methane fermentation tub 7 is utilized, the hydrogen sulfide gas in biogas oxidizes, and it becomes sulfuric acid. Moreover, gas churning equipment 8 is supplied, ** ozone oxidizes the hydrogen sulfide gas in biogas, and the ** ozone supplied from the biogas recovery line 21 generates sulfuric acid. These can protect now the corrosion in the gas utilization line which the problem had with the gas of hydrogen sulfide.

[0023] [Deodorization of the bad smell in an institution by 5:** ozone of ***** of operation] Although not illustrated, it differs in 1 of ***** of the operation mentioned above 5 of ***** of this operation in that the ** ozone discharged from the ozone reaction machine 3 is used for deodorization of the bad smell discharged from the institution which enforces the processing method of an organic waste. Bring the bad smell in an institution together in one place by a duct etc., and it is made to react with the ** ozone discharged from the ozone reaction machine 3, and deodorizes.

[0024] form [of operation of others / []: -- 1-5 of ***** of operation are arbitrary -- put together -] -- although this invention has been explained with reference to 1-5 of specific *****, other alternative methods or draft amendments of an embodiment can be adopted, without deviating from the soul and the range of this invention. That is, 1 and the combination of 5 of ***** of the

operation mentioned above are sufficient, and 2 and 3, and the combination of 4 of ***** of operation are sufficient. As a result, you may adopt and carry out the whole of 1 to the 5 of ***** of operation. therefore -- the processing method of the organic waste of this invention -- 1- of ***** of operation -- you may choose and combine two or more [arbitrary] from the 5. Moreover, or it made it branch instead of ** ozone from the line which blows ozone in the living thing processing step preceding paragraph, the ozone which made it newly generate can also be blown.

[0025]

[Effect of the Invention] According to this invention, ** ozone is reused and the processing method of the organic waste characterized by controlling the quantity of the ** ozone exhausted out of the system of an organic waste processing institution can be offered so that clearly from the above-mentioned place. Moreover, deodorization in the fall of the degree of color of final effluent, the fall of the hydrogen sulfide concentration in biogas, and the processing institution of an organic waste can be performed by effective use of ** ozone.

[Brief Description of the Drawings]

[Drawing 1] It is the flow chart having shown the form of 1 implementation of the processing method of the organic waste concerning this invention.

[Drawing 2] It is the flow chart having shown the form of other operations of the processing method of the organic waste concerning this invention.

[Drawing 3] It is the flow chart of the processing method of the organic waste concerning this invention having shown the form of other operations further.

[Drawing 4] It is the flow chart of the processing method of the organic waste concerning this invention having shown the form of other operations further.

[Explanations of letters or numerals]

1 Organic Wastes, Such as Livestock Feces and Urine

2 Impurity Removal, Crush

3 Ozone Reaction Machine

4 Heating Device

5 Ozone Generator

6 ** Ozone

7 Methane Fermentation Tub (Living Thing Processing Step)

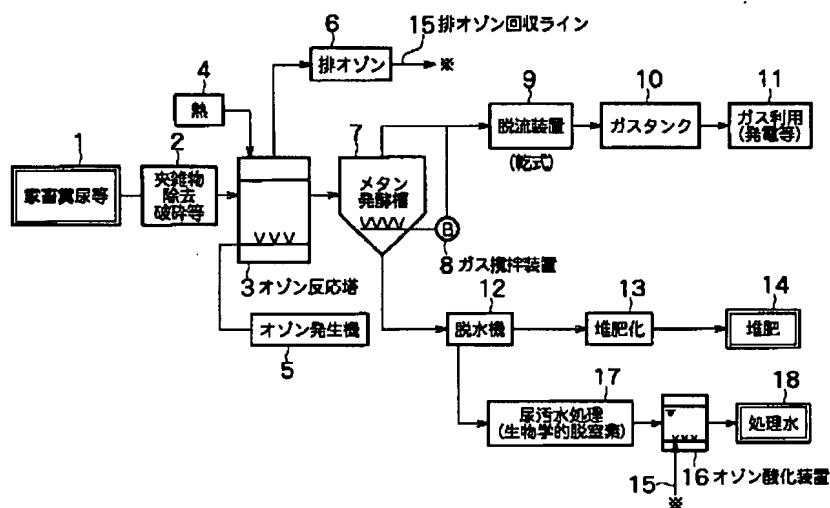
8 Gas Churning Equipment

9 Desulfurization Facility

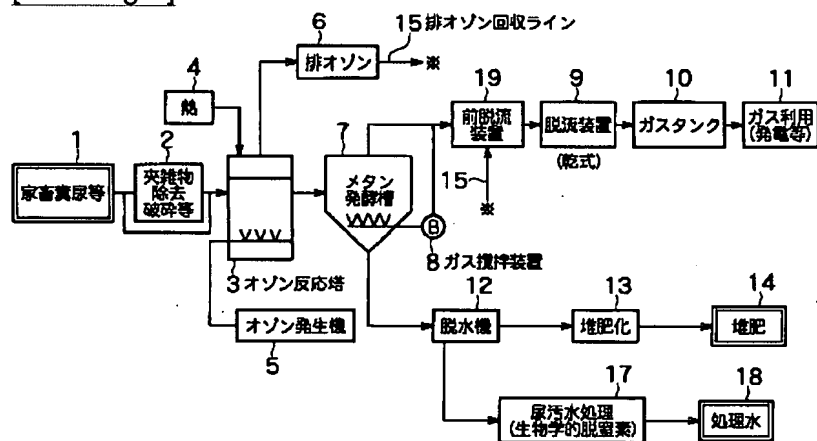
10 Gas Tank

- 11 Gas Utilization (Power Generation Etc.)
- 12 Dehydrator
- 13 Composting
- 14 Compost
- 15 ** Ozone Recovery Line
- 16 Ozone Oxidization Equipment
- 17 Urine Sewage Disposal
- 18 Treated Water
- 19 Front Desulfurization Facility
- 20 Line
- 21 Biogas Recovery Line

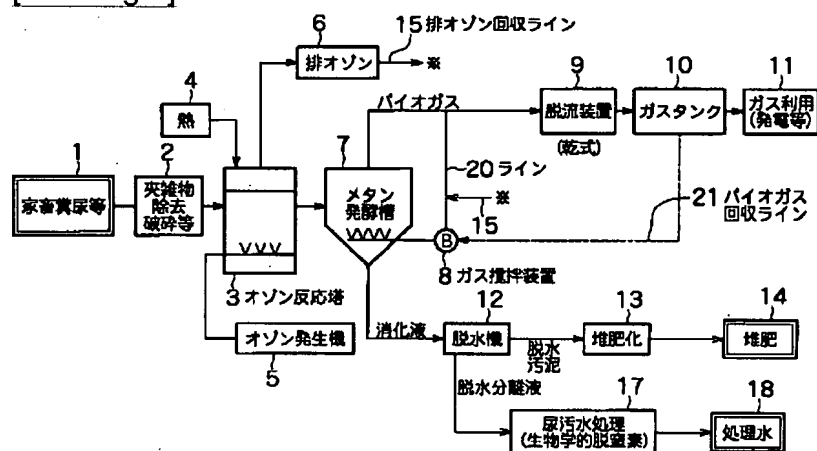
http://dossier1.ipdl.inpit.go.jp/cgi-bin/tran_web_cgi_ejje?u=http%3A%2F%2Fdossier1.ipdl.i... 9/17/07



[Drawing 3]



[Drawing 4]



[Translation done.]